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Brooks

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(54) **SELF-RETAINING PIPE CUTTING
TEMPLATE**

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B43L 9/00 (2006.01)

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(58) **Field of Classification Search** **33/21.1, 33/21.3, 27.12, 41.6, 562**
See application file for complete search history.

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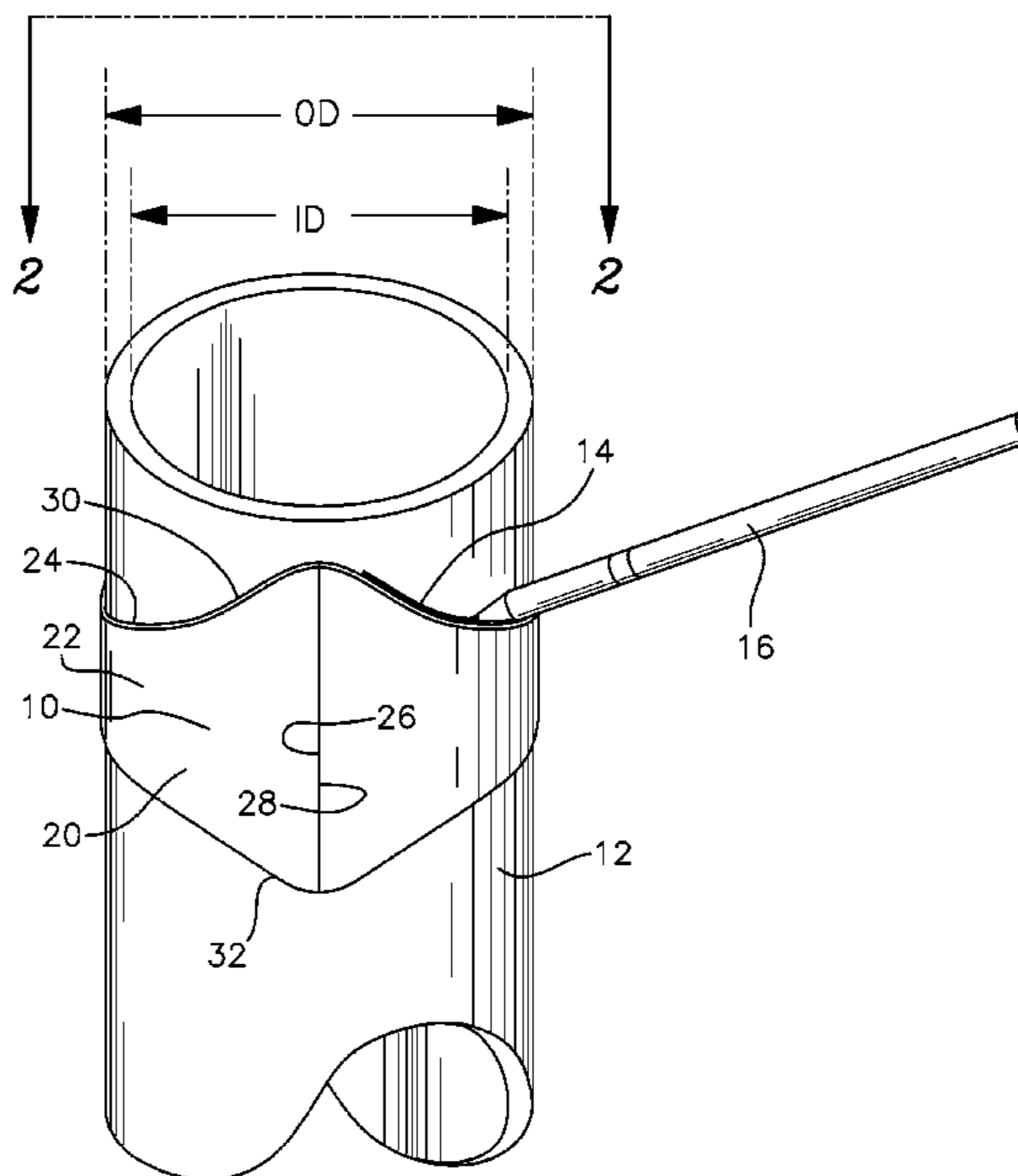
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(57) **ABSTRACT**

Pipe cutting templates for marking cutting lines on pipes for subsequent connection to another pipe. A template includes a flexible magnetic sheet having a front surface and a rear magnetized surface for retaining the sheet on the pipe. The sheet has a pair of straight side edges parallel to each other and defining a width of the sheet, the width of the sheet corresponding to the diameter of the pipe such that, during use when the sheet is wrapped around the pipe, the side edges abut. The sheet additionally has a pair of opposed end edges. At least one of the end edges is contoured to serve as a guide for marking the pipe with a cutting line corresponding to the pipe diameter, at least one particular connection type, and at least one particular angle of connection.

5 Claims, 4 Drawing Sheets



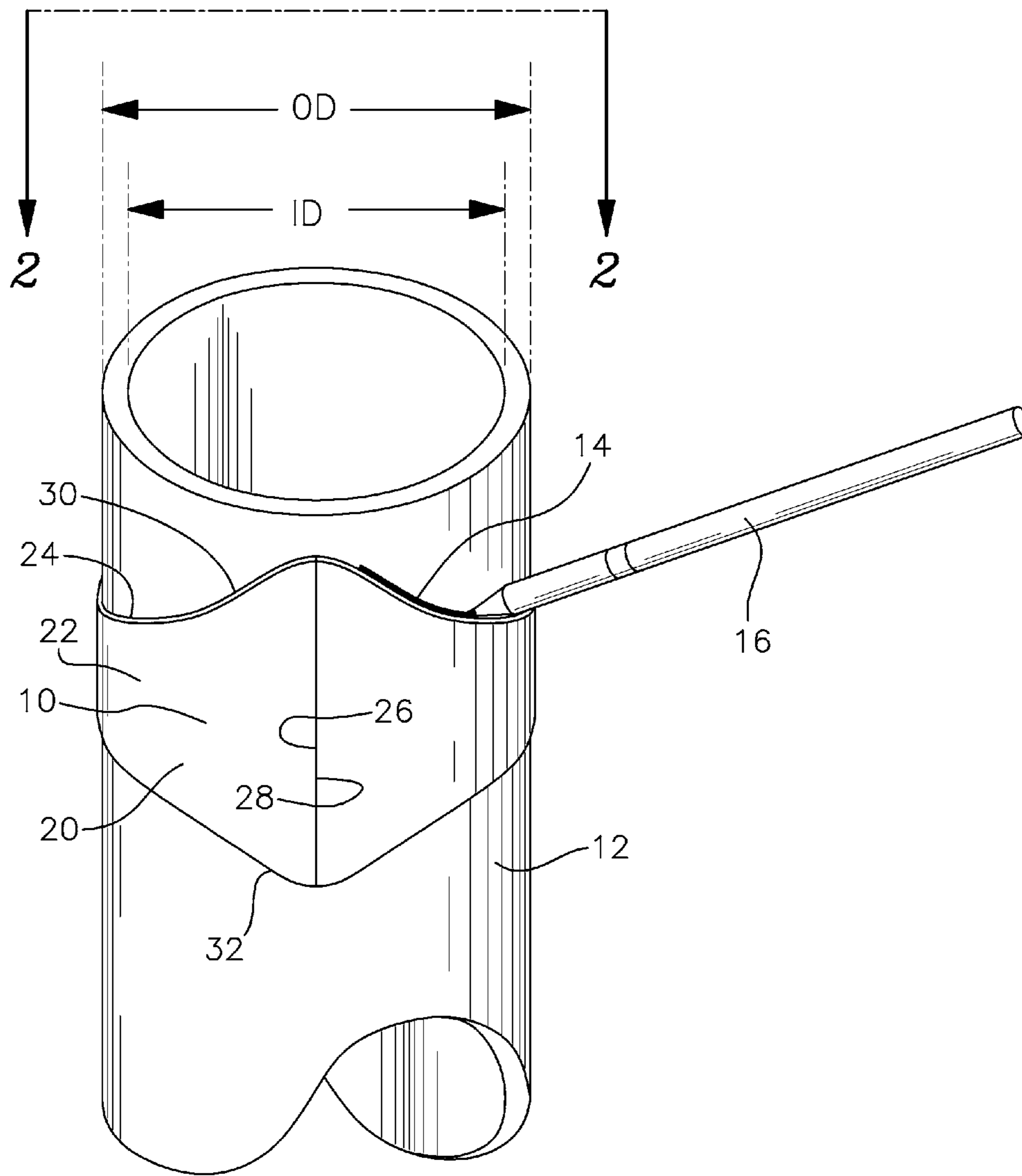


Fig. 1

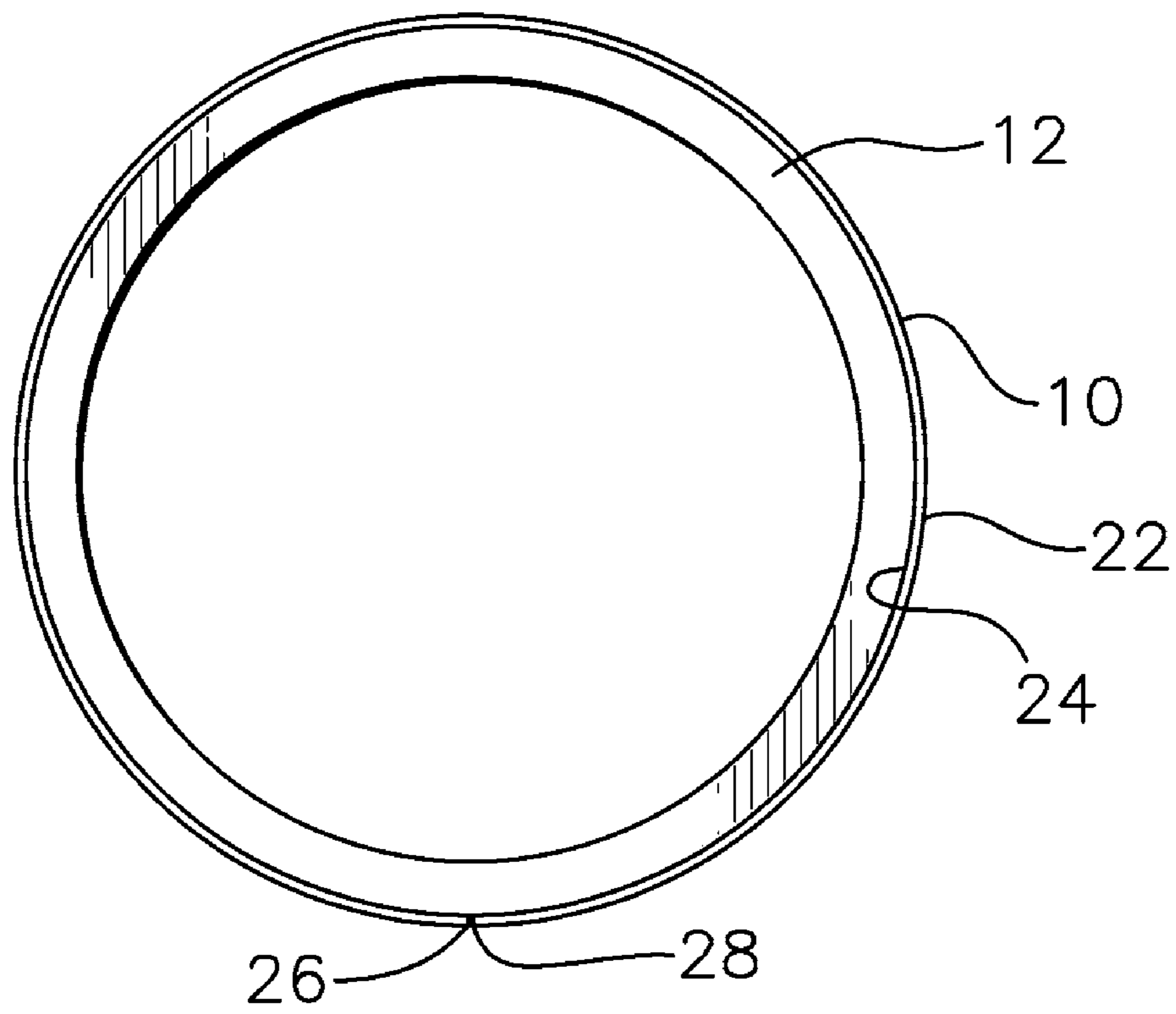
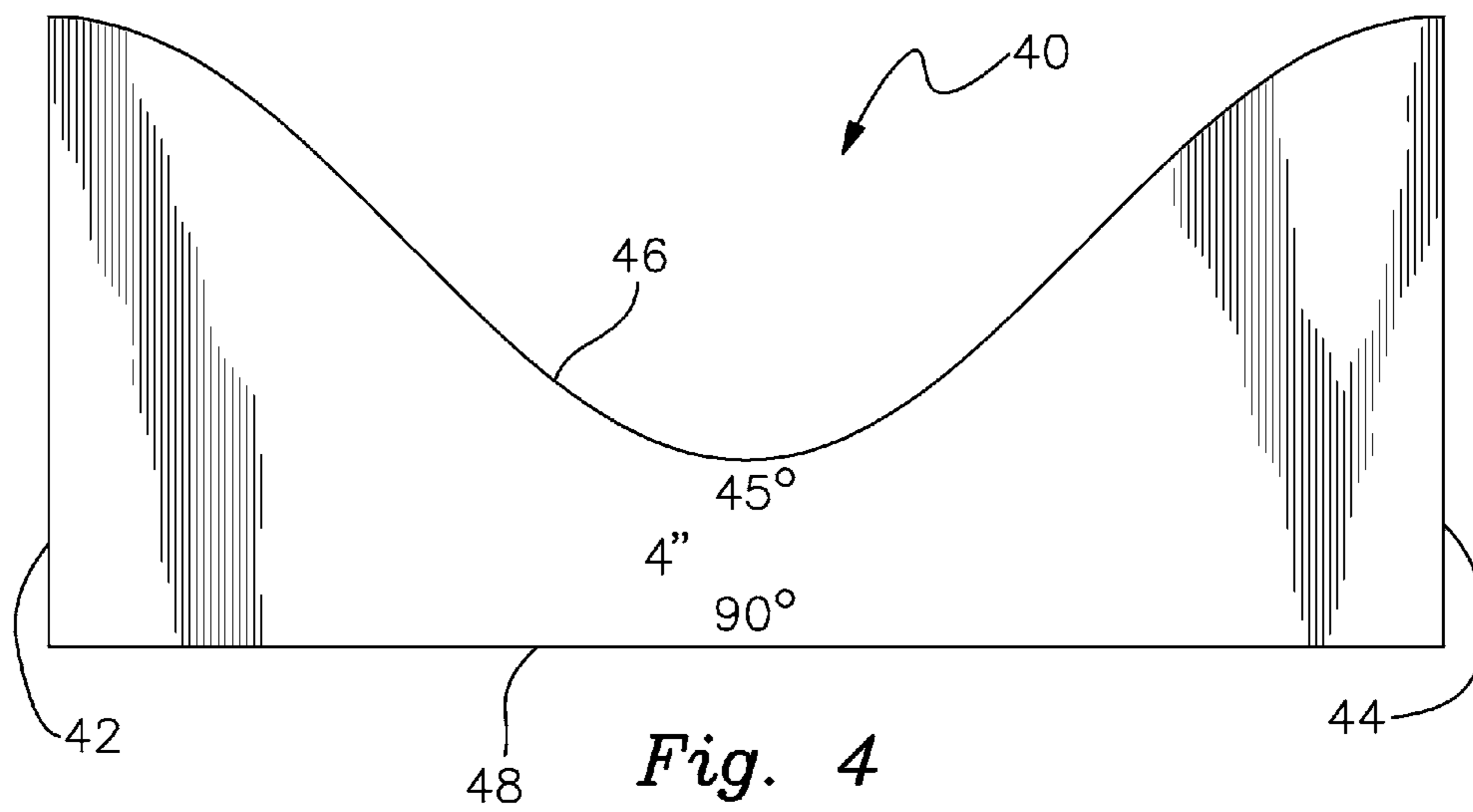
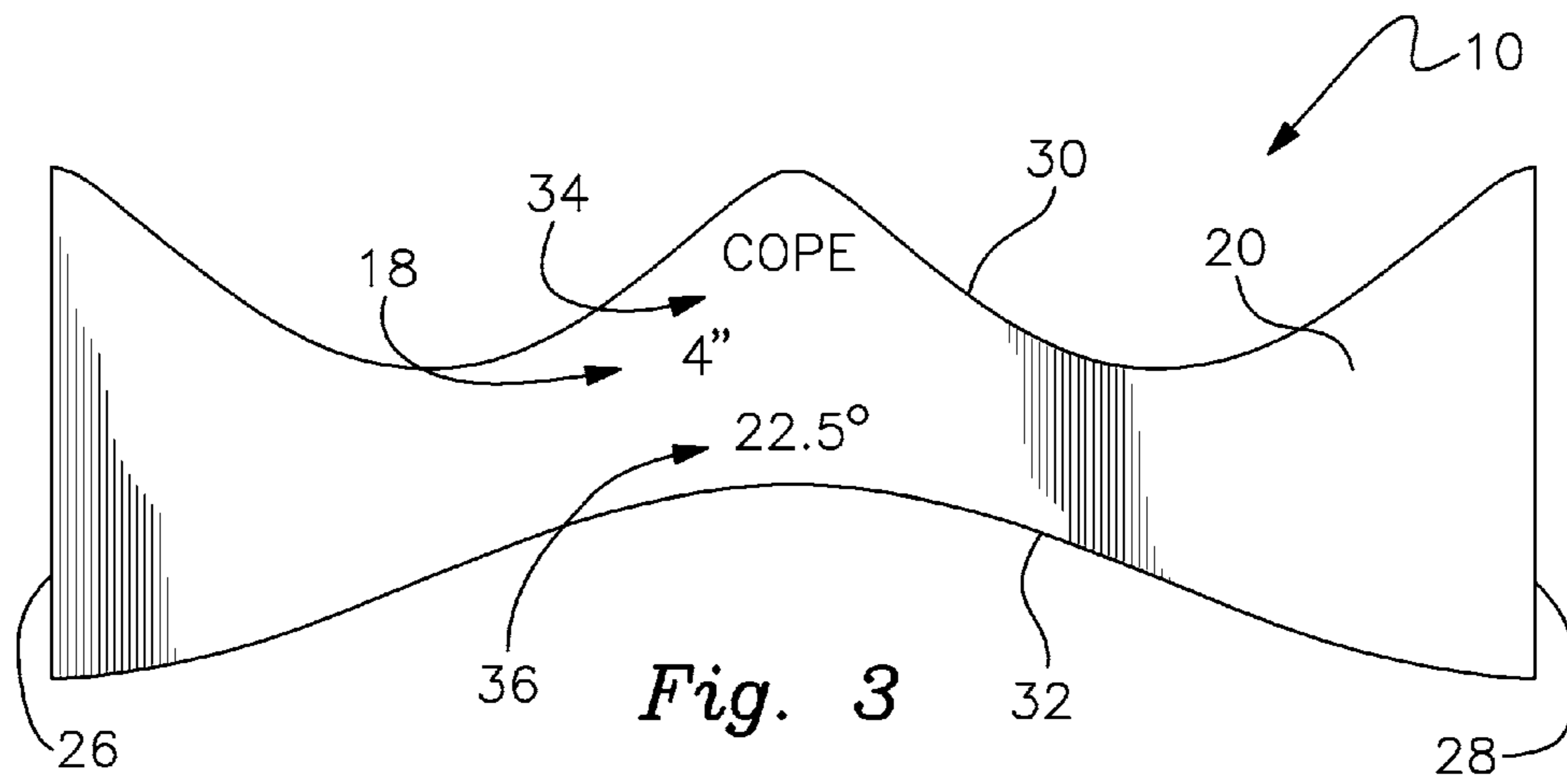
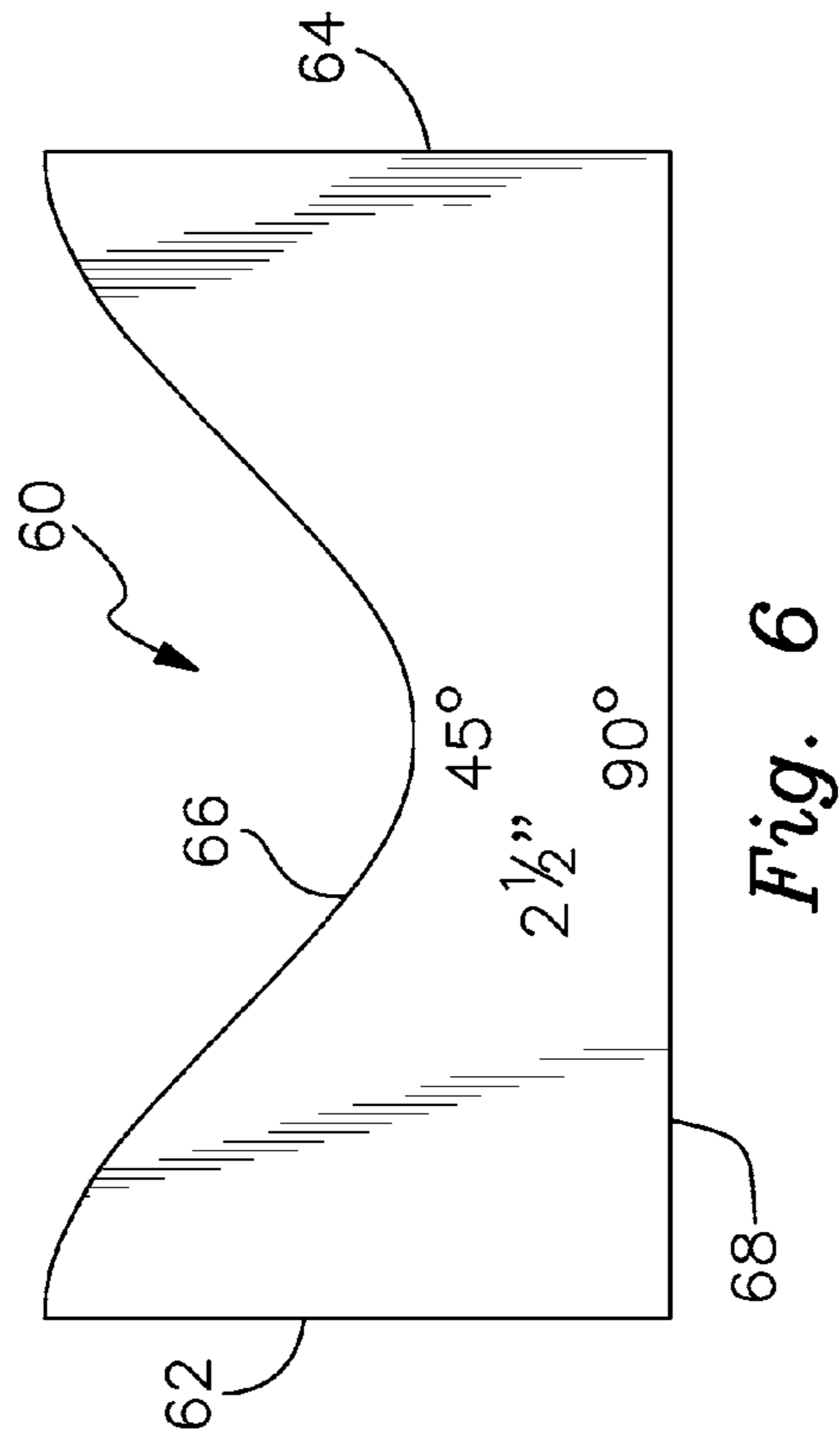
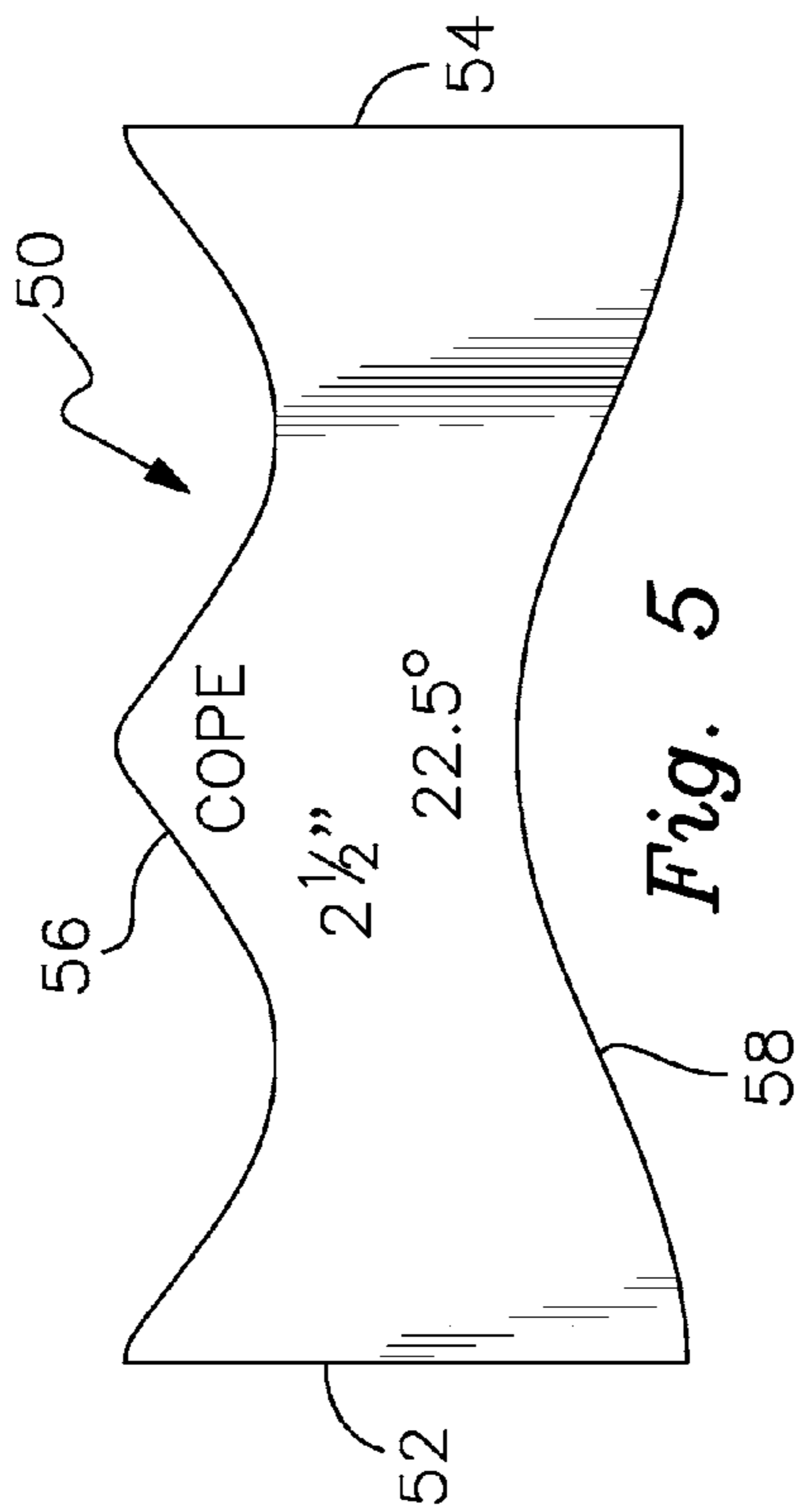
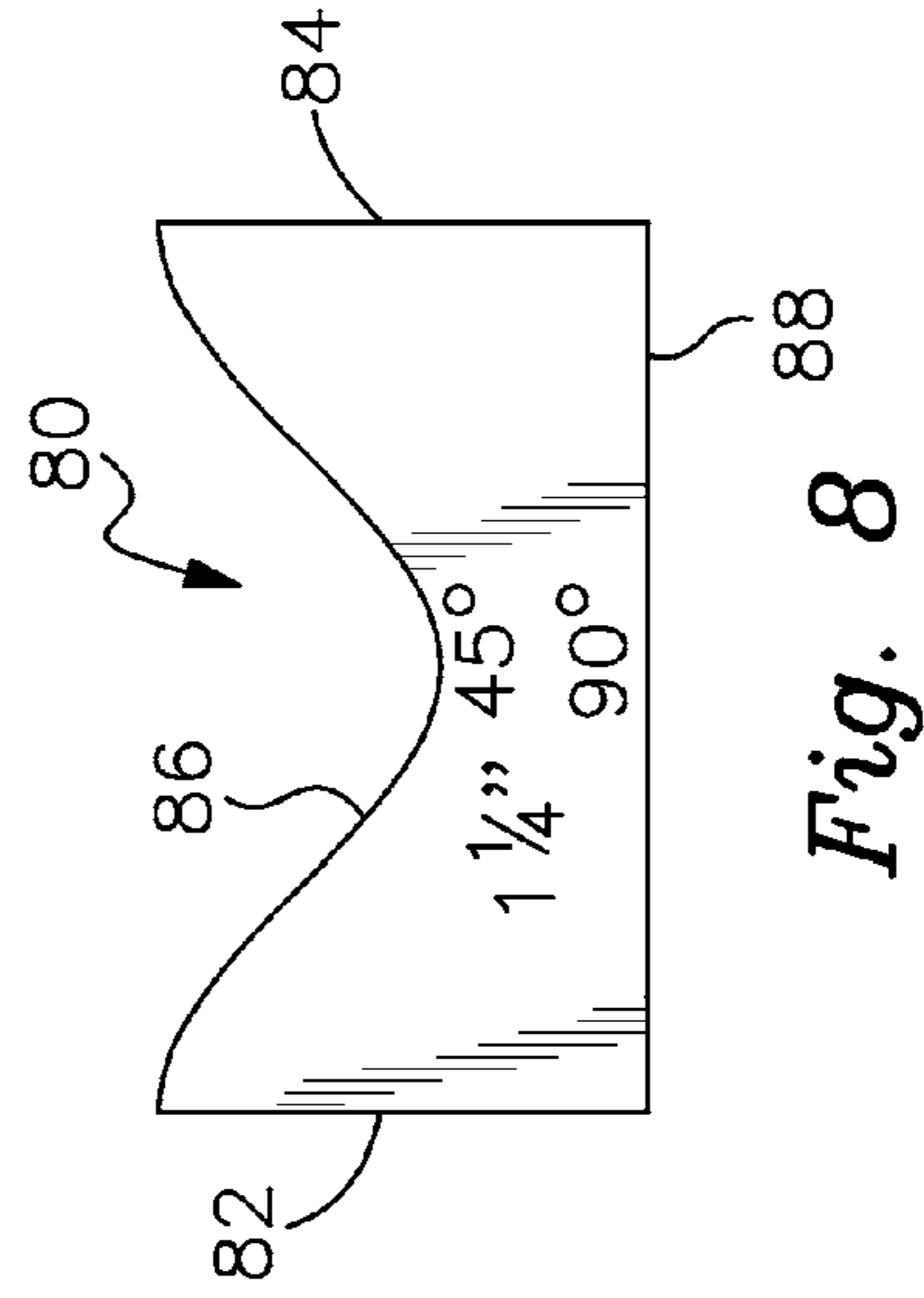
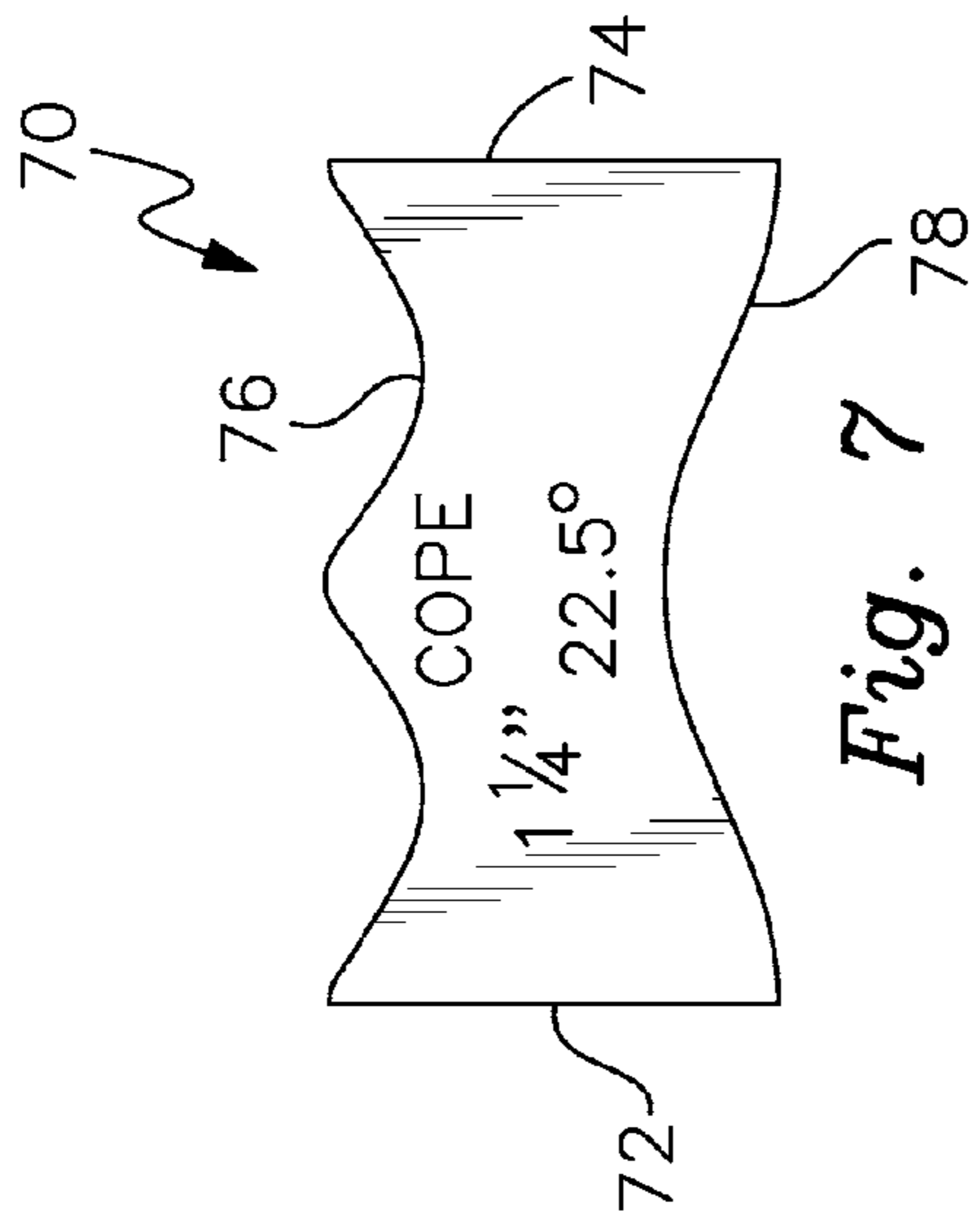


Fig. 2





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SELF-RETAINING PIPE CUTTING TEMPLATE

BACKGROUND OF THE INVENTION

The invention relates to pipe cutting templates for marking cutting lines on pipes for subsequent connection to another pipe.

The development and use of pipe cutting templates is well known for the fabrication of various connection or intersection types, such as end-to-end pipe connections at various angles such as 45°, 90°, and 180° (straight end-to-end); as well as connections or intersections between a trunk pipe and a branch pipe, which require a saddle or cope contoured cut.

SUMMARY OF THE INVENTION

In one aspect, a wrap-around pipe cutting template for marking a cutting line on a pipe having a particular diameter and a corresponding circumference for cutting the pipe in preparation for connection to another pipe employing at least one particular connection type and at least one particular angle of connection is provided. The template includes a flexible magnetic sheet having a front surface and a rear magnetized surface for retaining the sheet on the pipe; the sheet having a pair of straight side edges parallel to each other and defining a width of the sheet, the width of the sheet corresponding to the diameter of the pipe such that, during use when the sheet is wrapped around the pipe, the side edges abut; and the sheet additionally having a pair of opposed end edges, at least one of the end edges contoured to serve as a guide for marking the pipe with a cutting line corresponding to the pipe diameter, the at least one particular connection type, and the at least one particular angle of connection.

In another aspect, a set of wrap-around pipe cutting templates for marking cutting lines on pipes having various particular diameters and corresponding circumferences for cutting a pipe in preparation for connection to another pipe employing various connection types and at various particular angles of connection is provided. The set includes a plurality of flexible magnetic sheets, each of the sheets having a front surface and a rear magnetized surface for retaining the sheet on the pipe. Each of the sheets has a pair of straight side edges parallel to each other and defining a width of the sheet, the width of the sheet corresponding to the diameter of the pipe such that, during use when the sheet is wrapped around the pipe, the side edges abut. Each of the sheets additionally has a pair of opposed end edges, at least one of the end edges contoured to serve as a guide for marking the pipe with a cutting line corresponding to the pipe diameter, the at least one particular connection type, and the at least one particular angle of connection.

In yet another aspect, a method of cutting a pipe having a particular diameter and a corresponding circumference in preparation for connection to another pipe employing at least one particular connection type and at least one particular angle of connection is provided. The method includes the step of providing a wrap-around pipe cutting template sized for the particular pipe diameter and corresponding circumference, the template in turn including a flexible magnetic sheet having a front surface and a rear magnetized surface for retaining the sheet on the pipe, the sheet having a pair of straight side edges parallel to each other and defining a width of the sheet, the width of the sheet corresponding to the diameter of the pipe such that, during use when the sheet is wrapped around the pipe, the side edges abut, and the sheet additionally having a pair of opposed end edges, at least one of the end edges

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contoured to serve as a guide for marking the pipe with a cutting line corresponding to the pipe diameter, the at least one particular connection type, and the at least one particular angle of connection. The method includes the further steps of wrapping the template around the pipe and magnetically securing the template to the pipe so that the side edges abut, and employing the at least one of the end edges as a guide to mark the pipe for subsequent cutting.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a three-dimensional illustration of a cutting template embodying the invention wrapped around a pipe and in use;

FIG. 2 is an end view taken generally on line 2-2 of FIG. 1;

FIG. 3 is a developed view of a template embodying the invention sized for a pipe having an inside diameter (ID) of 4";

FIG. 4 is a developed view of another template embodying the invention, also sized for a 4" ID pipe;

FIG. 5 is a developed view of another template embodying the invention, sized for a two and one-half inches ID pipe;

FIG. 6 is another template embodying the invention, also sized for a two and one-half inches ID pipe;

FIG. 7 is a developed view of another template embodying the invention, sized for a 1¼" ID pipe; and

FIG. 8 is a developed view of another template embodying the invention, sized for a 1¼" ID pipe.

DETAILED DESCRIPTION

FIGS. 1 and 2 illustrate a representative wrap-around pipe cutting template 10 wrapped around a representative pipe 12 and in use as an aid for marking a cutting line, part of which is represented at 14, on the pipe 12. FIG. 3 shows the representative template 10 illustrated as it appears when laid out flat, i.e., a developed view. The cutting line 14 accordingly serves as a reference for subsequently cutting the pipe 12 in preparation for connection to another pipe (not shown). A representative marking device 16, such as a pen or pencil, is shown. As employed herein, the terminology "cutting line" does not necessarily refer to a continuous line. Rather, the cutting line 14 may take any form sufficient to guide a cutting device, such as a cutting torch. Examples are a series of dots (i.e. a dotted line) and a series of dashes (i.e. a dash line).

It will be appreciated that pipes are available in standard sizes, characterized by an inside diameter (ID) and an outside diameter (OD), as indicated in FIG. 1. Pipes are specified in various nominal sizes. For smaller diameter pipes, that is pipes up to twelve inches in diameter, the pipe size ordinarily is specified by the inside diameter (ID), and the outside diameter (OD) accordingly is greater in view of the pipe wall thickness. In any event, the representative template 10 is sized in view of the outside diameter (OD) of the pipe 12.

In FIG. 1, the representative pipe 12 has an inside diameter (ID) of four inches. The template 10, as illustrated in FIG. 3 when laid out flat, is marked with a pipe size indicium 18 which reads "4", indicating the template 10 is for use with pipes having an ID of four inches.

The template 10 more particularly is made of flexible magnetic sheet, widely available as a stock material, and may be die cut. The flexible magnetic sheet 12 has a front surface 22 and a rear magnetized surface 24 for retaining the sheet 20 on the representative pipe 12. The flexible magnetic sheet 20 accordingly is self-retaining on the pipe 12 for convenient use, and additionally is sufficiently robust to serve repeatedly as a template, and has sufficient thickness to reliably guide the

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marking device **16**. Accordingly, during use the template **10** is wrapped around the pipe **12**, and magnetically secured.

With particular reference to FIG. **3**, the flexible magnetic sheet **20** has a pair of straight side edges **26** and **28** which are parallel to each other and which define the width of the sheet **20**. The width of the sheet **20** (between the two side edges **26** and **28**) is equal to the nominal circumference of the pipe **12** corresponding to its nominal diameter. In this context, the term "diameter" refers to the outside diameter (OD). Accordingly, the width is such that, during use when the sheet **20** is wrapped around the pipe **12**, the side edges **26** and **28** abut.

The sheet **20** additionally has a pair of opposed end edges **30** and **32**. At least one of the end edges **30** and **32**, and preferably both, is contoured to serve as a guide for marking the pipe **12** with a cutting line (e.g., the cutting line **14**) corresponding to the pipe diameter, a particular desired connection or interface type, and a particular angle of connection.

In the example of FIG. **3**, the upper end edge **30** is for marking a pipe to make a cope or saddle joint, employed to join the end of a branch pipe (the pipe **12** being marked) to a trunk pipe (not shown). The lower end edge **32** is employed to define a contour for cutting a pipe end at an angle of 22.5° (in the nature of a miter cut) for joining two pipes end-to-end at an angle of 45°. In addition to the pipe size indicium **18** ("4"), the template **10** is marked with exemplary connection type and angle indicia **34** and **36**. Indicum **34** ("COPE") indicates the upper end edge **30** is for marking a cutting line for a cope or saddle joint, and indicium **36** ("22.5°") is for marking a cutting line for an angle cut of 22.5°.

Graphical techniques for generating template contours are well known. In addition, computer software packages are available for generating such contours. In addition, generalized 3D solid modeling software such as "Autodesk Inventor" can be employed.

Wrap-around pipe cutting templates embodying the invention preferably are provided as a set, represented by the templates of FIGS. **3-8** collectively, as a small but representative set. Thus, templates are provided for making cutting lines on pipes having various particular diameters (and corresponding circumferences) for cutting pipes in preparation for connection to another pipe employing various connection types and at various particular angles of connection.

In FIG. **1**, the template is oriented in the same orientation as in FIG. **3** that is, with the end edge **30** employed as a marking guide. Alternatively, the template **10** of FIG. **3** can be placed in the opposite orientation, in which case the end edge **32** is employed as the marking guide.

FIG. **4** more particularly represents a template **40**, also for a four inch ID pipe, having parallel side edges **42** and **44** and a pair of opposed end edges **46** and **48** contoured, respectively, for marking a pipe for cutting at a 45° angle for a 90° connection to another pipe, and for marking a pipe at a 90° angle for straight (e.g. 180°) end-to-end connection to another pipe.

FIG. **5** represents a template **50** for marking cutting lines on a pipe having an ID of two and one-half inches. The template **50** has parallel side edges **52** and **54** and a pair of opposed end edges **56** and **58** contoured, respectively, for marking a pipe to make a cope or saddle joint, and for marking a pipe to make an angle cut of 22.5°.

FIG. **6** represents another template **60** for a two and one-half inch ID pipe, having parallel side edges **62** and **64** and a pair of opposed end edges **66** and **68** contoured, respectively, for marking a pipe for cutting at a 45° angle for a 90° connection to another pipe, and for marking a pipe at a 90° angle for straight (e.g. 180°) end-to-end connection to another pipe.

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FIG. **7** represents a template **70** for marking cutting lines on a pipe having an ID of one and one-quarter inches. The template **70** has parallel side edges **72** and **74** and a pair of opposed end edges **76** and **78** contoured, respectively, for marking a pipe to make a cope or saddle joint, and for marking a pipe to make an angle cut of 22.5°.

Finally, FIG. **8** represents another template **80** for a one and one-quarter inch ID pipe, having parallel side edges **82** and **84** and a pair of opposed end edges **86** and **88** contoured, respectively, for marking a pipe for cutting at a 45° angle for a 90° connection to another pipe, and for marking a pipe at a 90° angle for straight (e.g. 180°) end-to-end connection to another pipe.

While specific embodiments of the invention have been illustrated and described herein, it is realized that numerous modifications and changes will occur to those skilled in the art. It is therefore to be understood that the appended claims are intended to cover all such modifications and changes as fall within the true spirit and scope of the invention.

The invention claimed is:

1. A wrap-around pipe cutting template for marking a cutting line on a pipe having a particular diameter and a corresponding circumference for cutting the pipe in preparation for connection to another pipe employing at least one particular connection type and at least one particular angle of connection, said template comprising:

a flexible magnetic sheet having a front surface and a rear magnetized surface for retaining said sheet on the pipe; said sheet having a pair of straight side edges parallel to each other and defining a width of said sheet, the width of said sheet corresponding to the diameter of the pipe such that, during use when said sheet is wrapped around the pipe, said side edges abut; and said sheet additionally having a pair of opposed end edges, at least one of said end edges not being straight but contoured to serve as a guide for marking the pipe with a curved cutting line corresponding to the pipe diameter, the at least one particular connection type, and the at least one particular angle of connection.

2. The template of claim 1, wherein another of said end edges is contoured to serve as a guide for marking the pipe with a cutting line corresponding to the pipe diameter, a particular connection type, and a particular angle of connection, either the particular connection type or the particular angle of connection of said other of said side edges differing from the particular connection type or the particular angle of connection of said at least one of said end edges.

3. A set of wrap-around pipe cutting templates for marking cutting lines on pipes having various particular diameters and corresponding circumferences for cutting a pipe in preparation for connection to another pipe employing various connection types and at various particular angles of connection, said set comprising:

a plurality of flexible magnetic sheets, each of said sheets having a front surface and a rear magnetized surface for retaining said sheet on the pipe; each of said sheets having a pair of straight side edges parallel to each other and defining a width of said sheet, the width of said sheet corresponding to the diameter of the pipe such that, during use when said sheet is wrapped around the pipe, said side edges abut; and each of said sheets additionally having a pair of opposed end edges, at least one of said end edges not being straight but contoured to serve as a guide for marking the pipe with a curved cutting line corresponding to the pipe diameter, the at least one particular connection type, and the at least one particular angle of connection.

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4. The template set of claim 3, wherein another of said end edges of each of said sheets is contoured to serve as a guide for marking the pipe with a cutting line corresponding to the pipe diameter, a particular connection type, and a particular angle of connection, either the particular connection type or the particular angle of connection of said other of said side edges differing from the particular connection type or the particular angle of connection of said at least one of said end edges.

5. A method of cutting a pipe having a particular diameter and a corresponding circumference in preparation for connection to another pipe employing at least one particular connection type and at least one particular angle of connection, said method comprising:

providing a wrap-around pipe cutting template sized for the particular pipe diameter and corresponding circumference, the template in turn comprising a flexible magnetic sheet having a front surface and a rear magnetized surface for retaining the sheet on the pipe, the sheet

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having a pair of straight side edges parallel to each other and defining a width of the sheet, the width of the sheet corresponding to the diameter of the pipe such that, during use when the sheet is wrapped around the pipe, the side edges abut, and the sheet additionally having a pair of opposed end edges, at least one of the end edges not being straight but contoured to serve as a guide for marking the pipe with a curved cutting line corresponding to the pipe diameter, the at least one particular connection type, and the at least one particular angle of connection;

wrapping the template around the pipe and magnetically securing the template to the pipe so that the side edges abut; and

employing the at least one of the end edges as a guide to mark the pipe for subsequent cutting.

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